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GEOGRAPHIC SCHOOL BULLETINS

of

The National Geographic Society

WASHINGTON 6, D. C.

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FENNO JACOBS FROM THREE LIONS

DERBY HATS ARE THE CUSTOMARY HEADGEAR OF BOLIVIA'S INDIAN WOMEN

Destined for the dinner table, the rooster advertises this farm woman's products on market day. Butter and eggs are important, but, in the high Andes city of La Paz, tin (Bulletin No. 4) is really king.

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Bulletin No. 1, April 9, 1951

Air Lines Put Iguazú Falls on Travel Routes

SOUTH AMERICA'S Iguazú Falls, often bracketed with North America's Niagara and Africa's Victoria Falls as the world's cataract giants, is no longer a remote objective for a tedious expedition.

Not only has air travel brought Brazil and Argentina days closer to the United States in recent years, but the two South American republics, sharing opposite banks of Iguazú's wide triple-horseshoe brink, are steadily beating better paths for tourists from their own big coastal cities to this majestic natural wonder in their wilderness.

Airport Carved Out of Wilds

So far, Argentina has had the better of the competition. For decades it has maintained a good, small hotel in the national park on its side, west of the falls. However, Brazil has recently announced plans to build a modern hotel close to the cataract on the Brazilian side.

Iguazú Falls has been far from tourist trails. For many years, only travelers with much time on their hands and money in their purses could hope to view its spectacular performance. It lies a dozen miles east from the point where its river, the Iguazú (spelled Iguaçú in Brazil), joins the lower Paraná. At this river junction the three republics—Argentina, Brazil, and Paraguay—meet. The little airport near by, carved out of the wilds during the past few years, is 600 miles northeastward from Buenos Aires and 720 miles southwestward from Rio de Janeiro.

Scheduled flights from these cities now bring vacationers to the falls area in about seven hours. From the airport, which has a Brazilian hotel, guests may journey by automobile road to the Brazilian side of the cataract. Across in Argentina, a good macadam road approaches the hotel which directly faces a section of the cataract.

Railroad and river steamer travel are still popular, however, for those who have more time. A 15-day excursion from Buenos Aires requires six days by boat up the Paraná and five days to return. This leaves four days to watch the spectacular waters and listen to their thunderous roar. Thus a five-day vacation for those traveling by air allows as much time at the scene as a two-weeks visit by surface approach.

Rainy Season Brings Greater Volume than Niagara's

Iguazú is nearly twice as wide as Niagara and Victoria. Including the islands at their brink, these famous cataracts are 5,300 and 5,700 feet, respectively, along their crest lines. Iguazú, counting precipitous San Martín Island and numerous other islets, is nearly two miles across its brink—an estimated 10,000 feet.

During the local rainy season, Iguazú has a greater water volume than Niagara. However, the United States-Canadian cataract has a far greater average volume. It varies little with the seasons because four of the Great Lakes regulate its flow.

ENTERED AS SECOND CLASS MATTER APRIL 27, 1943, POST OFFICE, WASHINGTON, D. C., UNDER ACT OF MARCH 3, 1879.
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CLIFTON ADAMS

PATRIARCH OF THE WORLD'S FOREST GIANTS IS EL TULE, THE FAMOUS CYPRESS IN THE STATE OF OAXACA, MEXICO

Literally ageless, since its carefully guarded trunk does not permit scientific investigation of its past history, the Tule cypress (Bulletin No. 3) is one of Oaxaca's great tourist attractions. The mild climate of the valley, where temperatures vary only about 13 degrees the year around, leads to a great age for a normally long-lived tree. More than 400 years ago the cypress was large enough to shelter Cortés and his forces on their historic march to Honduras. In recognition of his conquests for Spain, Charles V gave Cortés extensive lands in Oaxaca and the conquistadore was thereafter known as Marquis of the Valley. No state in Mexico has greater mineral wealth than Oaxaca. Its gold lured the Spaniards in the 16th century, but only recently has extensive development of natural resources begun.

Bulletin No. 2, April 9, 1951

New Weapons Roar at Aberdeen, Maryland

AT THE entrance to Aberdeen Proving Ground a 43,600-pound bomb stands like a 20-foot sentry. This blockbuster, about as obsolete as a totem pole, marks the gates of a grim laboratory of Mars, charged with perfecting the weapons of the nation's arsenal.

On Aberdeen's huge tract of Maryland's tidewater lowland the science of warfare marches ahead on seven-league boots.

Pioneer Names Remain

Here the cutting edge of America's sword and the strength of its shield and chariot are constantly being tested (illustration, next page). The proving ground, where bombs were once dropped from balloons, is now the world's most advanced ordnance laboratory. The Chesapeake's fringed shores reverberate with the weapons of the future; tanks, trucks, and tractor caissons roar over its wire-fenced, guarded reservation.

Sprawled across more than 100 square miles of land and water on the west shoulder of the upper Chesapeake, Aberdeen Proving Ground has fields, swamps, and woods with names which go back to Maryland's colonial days. Penny Come Quick Area and Poverty Island were once frontier outposts whose favorable positions protected the settlers from Indian raids. The Joppa Road, first wagon trail across Maryland, began where the village of Baltimore first stood at the head of boat traffic on the bay. Today a line of powder magazines marks this early settlement.

The fertile Aberdeen area became known as "the Garden of Eden." When the Army bought the land in 1917, some 3,000 human beings and 12,000 horses, mules, sheep, goats, and swine had to be moved from their homes.

The Bush and Gunpowder rivers, fed by wandering creeks, made the upper bay region a paradise for duck hunters and fishermen. Just above Aberdeen the Susquehanna, emptying into the Chesapeake, forms a funnel for waterfowl migrating along the Atlantic flyway. In the autumn the boom of shotguns from the river flats echoes the thunder of artillery.

Land and Water Patrols Maintain Safety

Hundreds of deer live inside the 74,435-acre preserve, yet rarely is one killed by shells which scream into Aberdeen's target areas. Somehow deer avoid the danger spots and live unseen amid modern violence.

Patrols guard wire fences to keep out hunters. The "Aberdeen Fleet" warns away yachtsmen and fishermen during firing tests.

The first gun was fired at Aberdeen on January 2, 1918, in a driving snowstorm. Guns have been firing ever since, to chart the ballistics tables without which the Army couldn't aim a gun. The proving ground is the key point for the development and testing of all weapons, ammunition, vehicles, guided missiles, fire-control equipment, and other ordnance materiel of the Army, and some for the Navy and Air Force.

The Ordnance School is an artillery university, training officers and enlisted men. The Ordnance Depot ships trainloads of weapons and ammunition to the field forces each day, including those now in Korea.

In the Ballistics Research Laboratory, mathematicians, physicists,

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Unlike Niagara, both Iguazú and Victoria drop from escarpments sufficiently flat so that in the dry season canoes may safely ply the still waters just above their falls. Both African and South American rivers rage and churn furiously in deeper, narrower gorges than Niagara's below their cataracts.

Projecting rock ledges break most of Iguazú's 210-foot average drop into two leaps of a little more than 100 feet each. Niagara's 167-foot drop is not quite half that of Victoria, but perhaps more impressive than Iguazú's interrupted fall.

Natives in the neighborhoods of the cataracts gave each a descriptive name long ago. Iguazú is the word the Guarani Indians had for "giant waters." Iroquois Indians named Niagara, which means "thundering waters." Before Livingstone's day, Africans knew Victoria Falls as Mosi-oa-tunya—"the smoke that thunders."

NOTE: Iguazú Falls may be located on the National Geographic Society's map of South America. Write the Society's headquarters, Washington 6, D. C., for a price list of maps.

For further information about waterfalls, see "Land of the Havasupai," in the *National Geographic Magazine* for May, 1948*; "Through Paraguay and Southern Matto Grosso," October, 1943*; "River-Encircled Paraguay," April, 1933; and "The World's Great Waterfalls," July, 1926. (Last two issues listed are out of print; refer to your library.) *(Issues marked with an asterisk are included on a special list of Magazines available to teachers in packets of ten for $1.00; issues unmarked are 50¢ a copy.)*

THEODORE W. NOYES

IN STEPS AND SECTIONS, IGUAZÚ FALLS THUNDERS INTO DEVIL'S THROAT CHASM

Only from the air can Iguazú Falls, the world's broadest cataract, be seen as a whole. San Martín Island (right) projects from the Argentine shore, dividing Bossetti and San Martín Falls from the greatest cataract of the group—Union Falls (background, at end of chasm). At the left, Floriano Falls dashes itself into the gorge from the Brazilian side. Iguazú's two main cataracts and a hundred lesser ones present a dramatic panorama to travelers who seek its wilderness site by air or water.

Bulletin No. 3, April 9, 1951

World's Most Gigantic Tree Stands in Mexico

THE biggest and oldest tree in the world—where is it?

While California's Big Trees *(Sequoia gigantea)* have no peers as a species either in bulk or age, there is a single tree that outranks even the biggest sequoia in diameter and may surpass it in age.

The botanical colossus is the Tule cypress of Santa María del Tule (illustration, inside cover), six miles from Oaxaca (illustration, next page), in southern Mexico. It is a *Taxodium mucronatum*, the same type of cypress that grows in Chapultepec Park in Mexico City.

Broader than It Is Tall

Thousands of years old, yet still green and vigorous, the Tule tree's plump, rounded shape suggests an old oak rather than the usual slim cypress. "El Tule," as it is called, is so massive that 30 people, touching fingertips of outstretched arms, can barely encircle it.

This Goliath among trees boasts a trunk whose girth, five feet above ground, is about 112 feet, and whose diameter is 36 feet. Only about 140 feet high (not nearly as high as California's conifers), El Tule is broader than it is tall, for it has a branch spread of 150 feet.

Indians of the region hold the huge cypress in such reverence that a thoughtless visitor, attempting to initial it or snatch a shred of bark for a souvenir, might be in danger of physical harm. So jealously do the people guard El Tule that no scientific age studies, based on boring or cutting into the enormous bole, have yet been possible. But many scientific experts claim the Tule cypress is the world's oldest known living tree. They estimate that it is between 3,000 and 6,000 years old. It has outlived conquests, revolutions, natural cataclysms—even whole civilizations.

The Zapotec and Mixtec Indian tribes of this part of Mexico worshipped trees long before the Spaniards came in 1519. When Hernán Cortés and his armies overran the Aztec land, the conquistadores destroyed many shrine-trees as pagan symbols. But El Tule was spared. No one knows whether this was a concession to the adoration of the local tribes, or simply because the tree was too big to attack.

Mexican Name Means "Tree of Water"

Catholic missionaries, who followed on the heels of the Spanish invaders, declared the monumental cypress the property of the Church and an arm of God. They built a church in the very shadow of the tree. At Christmas and Easter the people of the vicinity still hold their fiestas under the spreading branches.

The Aztec word *ahuehuete* (pronounced "ah-we-we-te" and meaning "tree of water") is the Mexican name for the cypress species of which El Tule is far and away the mightiest representative.

Twelve feet above the ground, the Tule cypress bears a wooden plaque. It is largely overgrown, but some of the Spanish words carved on it can still be deciphered. The famous German geographer and traveler, Alexander von Humboldt, is said to have put up the plaque in 1803.

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and engineers from universities and industries all over America study the art of hurling explosives.

ENIAC, a room-sized electronic "brain," solves in weeks mathematical formulas and computations which would take years by pencil and paper. Results may be applied across the continent at White Sands, New Mexico; Muroc, California; Devil's Lake, North Dakota; or Banana River, Florida. Technicians from Aberdeen are assigned to each of these special proving grounds for guided missiles, rockets, and high-altitude bombing.

Outside Aberdeen's laboratories slotted concrete pillboxes on the "Main Front" watch over firing ranges which cross marshland and meadows to impact areas 35 miles away in the bay. Observation towers, including a dozen on Maryland's Eastern Shore, help direct this gunfire by maintaining radio contact with the firing base.

Aberdeen has been named "the brains of the Army." Its mission is to produce, abuse, and improve tomorrow's weapons. Those same weapons may be obsolete the day after tomorrow. But by then Aberdeen will be testing something newer.

NOTE: Aberdeen appears on the Society's map of the Northeastern United States.

For additional information on the Aberdeen region, see "Maryland Presents—," in the *National Geographic Magazine* for April, 1941*; and "Chesapeake Odyssey," September, 1939.

J. BAYLOR ROBERTS

IN THE BREAKDOWN TEST OF AN AIRCRAFT GUN AT ABERDEEN, A WOMAN PULLS THE TRIGGER

She pulls the rope trigger and fires the 20-mm. machine gun until it breaks down or the officer (background) blows his whistle. Women have filled many jobs at Aberdeen Proving Ground, disproving the idea that they couldn't stand the noise of the big guns, the crashing uproar of the shops. They have earned the tribute, "Women ordnance workers can stand anything."

Bulletin No. 4, April 9, 1951

Tin Advances from Devil to Cinderella

METALLURGISTS in ancient times called tin *Diabolus metallorum*—meaning "devil among metals." Uncle Sam, currently suffering a sharp pain in the pocketbook because of tin, is likely to agree with them.

For cans and pans and bottle caps, for bells and books and toothpaste tubes, the United States depends almost entirely upon mines and miners far from its borders. Yet its industries swallow nearly half of the world's total annual output of tin.

Chief Source Is Southeast Asia

Since the Korean war began, the price of tin on the world market has shot up with the speed of a skyrocket. It has soared to the highest level in history, nearly two and a half times its value of less than a year ago. Amid congressional charges of international price gouging, wartime controls have been put back on United States buying of tin.

Southeast Asia, ridged by tin-bearing mountains which sweep from Burma, Thailand, and Malaya to the islands of Indonesia, is the world's major tin source. Huge furnaces in Penang and Singapore pour forth millions of ingots of "Straits tin."

To feed smelters in Western Europe and the Longhorn furnace built during World War II at Texas City, Texas, Bolivia's Indians, (illustration, cover) bore into veins of tin ore in Andes mines more than 15,000 feet above sea level. In the Belgian Congo and Nigeria, African natives scoop it from jungle pockets. Ore and ingot alike must travel thousands of miles by sea before tin reaches American factories. It has traveled thus as long as ships have sailed.

Before Babylon was built, the earliest metalworkers mixed tin-rich earth with copper, and the age of bronze was born. Swarthy hawk-nosed Phoenician sailors pushed their tiny ships into the Atlantic to trade in tin with fur-clad Cornishmen on the coast of Britain. The Romans, although they gave tin its nickname, "devil," found the mines of Cornwall of great value in arming their legions.

Food and Photography Owe Much to Tin

Tin in the first cannons helped to break the grip of feudalism in Europe of the Middle Ages. Kings and commoners ate from dishes of pewter, an alloy of tin in which that metal is the chief constituent. English tinsmiths were so highly regarded that they had their own parliament and courts.

The science of photography used tin for prints in its early stages. The "tin can," which is made from tin-coated sheet steel (illustration, next page), ended the old Army custom of raiding the countryside for rations. By freeing men from the chore of growing their own food, it gave them more time to build up the cities of the world.

Sneered at even today by derogatory adjectives such as "tinny" and product nicknames like "tin lizzie," tin has become the Cinderella metal of modern life. The world rides on tin, with automobiles, trains, airplanes,

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An earlier Spanish explorer, Juan Bautista de Anza, suggested that the Tule cypress was not a single tree but a fusion of three separate trunks. Some botanists think this must be the case, since the tree is obviously a freak. No other tree of its kind can compare with El Tule in size. The fact that it is wider than it is high also bears out the multiple-trunk theory.

NOTE: Oaxaca may be located on the Society's map of Countries of the Caribbean.

For additional information, see "Down Mexico's Rio Balsas," in the *National Geographic Magazine* for August, 1946*; "On the Cortés Trail," September, 1940*; "In the Empire of the Aztecs," June, 1937; "Travels with a Donkey in Mexico," December, 1934; and "Among the Zapotecs of Mexico," May, 1927. (The last two issues listed are out of print; refer to your library.)

CLIFTON ADAMS

VAULTED ARCHES OF OAXACA'S MUNICIPAL BUILDING THROW THE SIDEWALKS IN SHADE

The Spanish-Moorish architecture brought by the Spaniards who occupied the Aztec city in 1521 is designed to resist earthquakes. Cobblestones laid in colonial days still pave some of the clean, well-kept streets. Oaxaca abounds in tales of the almost-legendary figures who people the early pages of Mexico's history. Cortés, Sandoval, and Alvarado are associated with the old city, and a descendant of Montezuma, living there on a government pension, was a link between the 20th century and the fabulous days of the conquistadores.

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Bulletin No. 5, April 9, 1951

Mountain Naming and Renaming Make News

CHOMOLUNGMA—have you heard of it? It's just the highest known mountain on earth—that's all. The Western world calls it Everest.

Proposals now are being put forth in Asia to call the giant peak Chomolungma and not Everest or any other non-Asian name. This campaign brings into focus the unpredictable way some of the world's loftiest summits get named and renamed, or remain unnamed.

One of Region's Few Western Names

Far from an exciting new name, Chomolungma is distinctly "old hat" to geographers. They now know mountains not only by their current designations, but also by the one or more native names they bore originally, to say nothing of the various aliases some peaks have carried in between. It was long ago that Tibet's cloistered lamas gazed upward from their sequestered valley to contemplate the height of heights which closed them in. They called it Chomolungma—Goddess Mother of the World.

Everest is, in fact, one of the few names of Western origin that has stuck through the thick and thin of 20th-century change to any of the many Asian crests that are higher than the highest other continents can boast. The name Everest was chosen in a casual sort of way.

British surveyors in India a century ago did not know the native name of the majestic massif on the Tibet-Nepal border whose pinnacle they viewed through their transits from afar. Charting it as Peak XV, they so knew it in 1852 when their calculations showed it to be 29,002 feet—the tallest of the tall.

Years passed, yet they still failed to find for it any native name such as the neighboring big peaks seemed to have. They dubbed Peak XV in honor of Sir George Everest, first surveyor-general of India. The name and the Number-One-altitude ranking have both survived.

Russia Renames for Soviet Officials

Only in the Karakoram Range of northern Kashmir 800 miles northwest of Everest do other of Asia's highest crests retain Western names. One is K2 (illustration, next page), second-highest on earth (28,250 feet). K2, like Peak XV, is a British surveyors' designation. Lofty Gasherbrum is still called Hidden Peak on occasion, while Broad Peak and Bride Peak are the labels of two 26,000-foot summits lacking native names.

The Soviet Union, liquidating reminders of tsarist days, continues to rename its prominent peaks. Gormo, its highest, 24,590 feet, in the Pamir Range of the Tadzhik Soviet Republic, is now Stalin Peak. Near by, Kaufman, second-highest in all Russia, nowadays is Lenin Peak. Other peaks looming large for those who see behind the Iron Curtain have recently been rechristened Mao Tze-tung, Paul Robeson, and Thirtieth of October.

Mt. McKinley, the Everest of North America, has older names as meaningful as Chomolungma. To aboriginal Indians of its part of Alaska, it was Denali—the Home of the Sun. To Alaska's 19th-century Russian settlers, McKinley was Bolshaya—the Great One.

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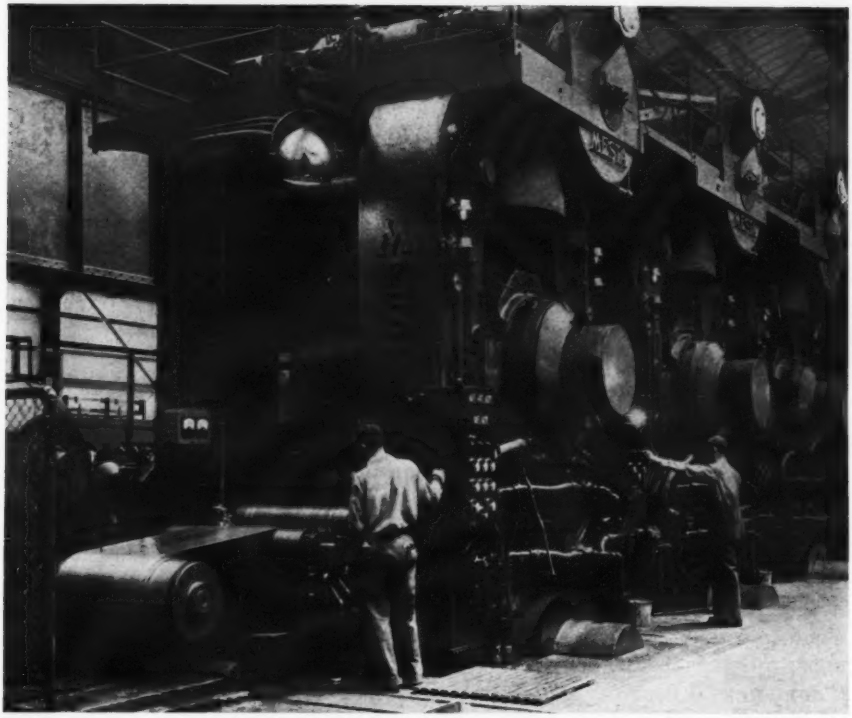
and ocean liners using tin in many different forms. Tin plate makes containers for thousands of different products. Collapsible tin tubes make many more ready to use at the squeeze of a finger. Tinfoil wraps many others, from kodak films to candy bars. It is even used as a container in baking; a chicken may be wrapped in it for roasting.

Type metal, another in the tin alloy legion, prints books, magazines, and newspapers. Babbitt metal makes possible soft replaceable engine bearings. Solder is the tie that binds metals together. As bell metal, tin rings from church towers all over the world. Gun metal contains tin; so does the bronze of the statues in the park.

By the standards of the alchemists, tin—*stannum* in Latin—was a "base" metal—too common to be ranked with gold or silver or platinum. But in today's troubled world, where a sudden halt of tin mining would cause industrial crisis and household discomfort, tin is a precious metal—plus.

NOTE: For further information, see "Bolivia—Tin Roof of the Andes," in the *National Geographic Magazine* for March, 1943*; "Metal Sinews of Strength," April, 1942 (out of print; refer to your library); "Tin, the Cinderella Metal," November, 1940; and, in the GEOGRAPHIC SCHOOL BULLETINS, November 15, 1948, "Unrest Hits Bolivia, the American Tibet."



AMERICAN CAN CO.

MATERIAL FOR TIN CANS EMERGES FROM MACHINES LIKE SO MANY LENGTHS OF "YARD GOODS"

In thin sheets, steel rolls out of "reducing" machines, ready for the bath of molten tin which will transform them to tin plate. In this form, the metal is suitable for packaging anything from coffee to kerosene. Cans made of tin alone would be too heavy and too expensive for the extensive use to which they are put.

Colorado had among its 14,000-foot summits a Mt. Wilson and a Wilson Peak. In 1945, it renamed the former Mt. Franklin Roosevelt. North Carolina, in 1947, named Mt. Craige and Big Tom, neighbors and close rivals of Mt. Mitchell, highest in the eastern United States.

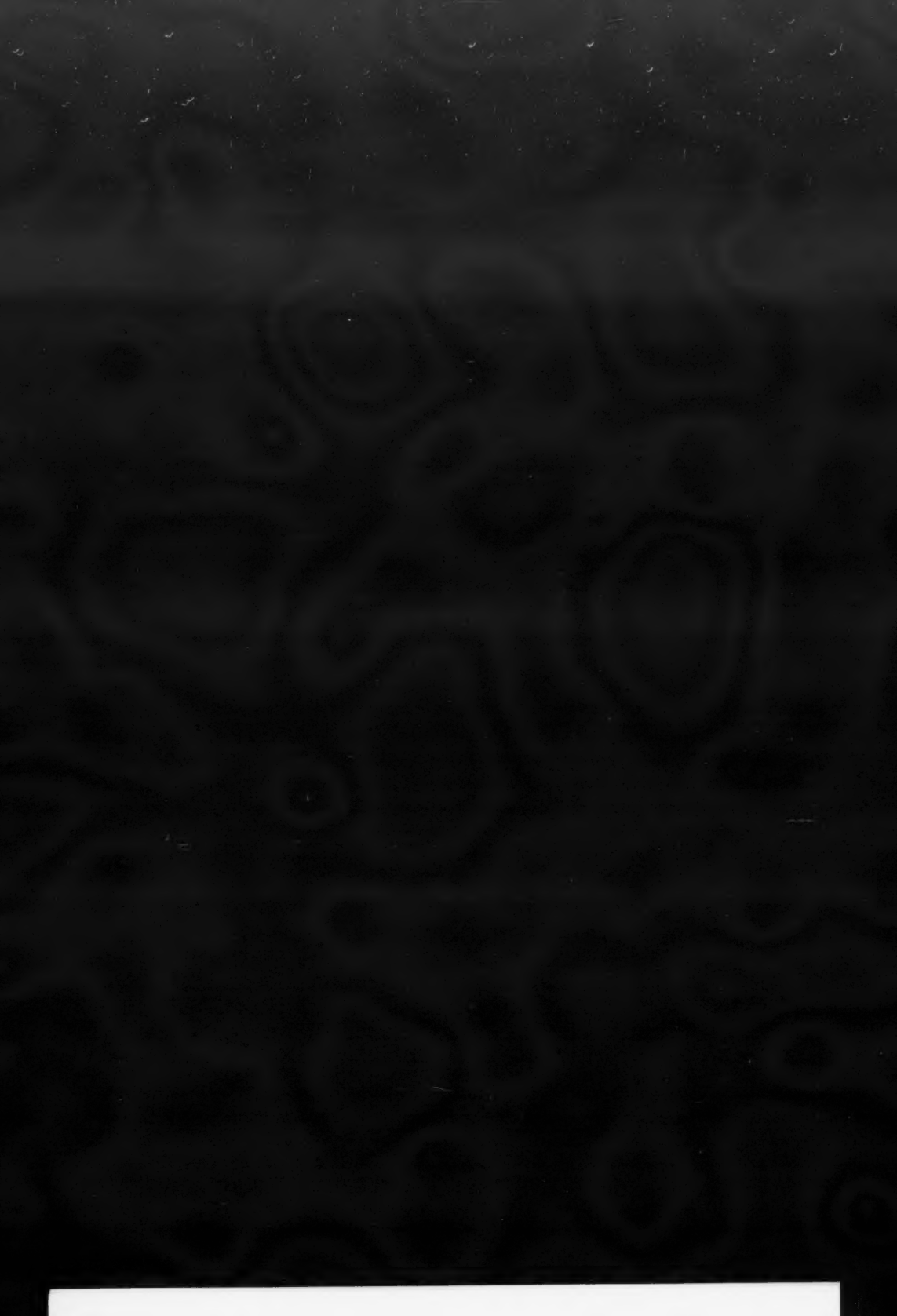
For most of the century Tacoma, Washington, residents have wanted to rename their skyline sentinel, Mt. Rainier. Tacoma, of Indian origin, is their first choice, but they say plenty of names would be an improvement on that of a British admiral who battled the patriots of 1776, and later explored Puget Sound. In this case, congress is the judge, and the established name continues.

NOTE: The Society's World Map notes the world's high mountain peaks.

For further information, see "Over the Roof of Our Continent," in the *National Geographic Magazine* for July, 1938; "Aërial Conquest of Everest," August, 1933; and "The World's Highest Altitudes and First Ascents," June, 1909 (out of print; refer to your library).

VITTORIO SELLA

IN A WORLD OF WHITE, MEN CAMP BEFORE ASSAILING K2, WORLD'S NUMBER-TWO PEAK

In Asia's Karakoram Range, this glittering crest is sometimes called Mt. Godwin Austen, after an English surveyor-general of India. Natives now call and spell it Kaytoo in preference to Dapsang, a local name. Italy's mountain-climbing Duke of the Abruzzi first scaled it, in 1909.

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